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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,073	03/25/2004	Christopher Parks	87135PCW	6988

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EXAMINER	
WANG, KENT F	

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,073	PARKS, CHRISTOPHER	
	Examiner	Art Unit	
	Kent Wang	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The reference listed on the disclosure statement (IDS) submitted on 03/25/2004 and 06/30/2005 have being considered by the examiner (see attached PTO 1449).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 9, 10-13, and 18 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hawkins, US 5,276,520.

Regarding claim 1, Hawkins discloses an image sensor comprising:

- a plurality of pixels in which at least two or more pixels have a charge control structure used to change charge capacity during the integration time (see Figs 4b and 4c, col. 3, lines 61-66, and col. 5, line5 – col. 6, line 32);
- wherein at substantially a beginning of an exposure time the charge capacity is altered to substantially zero by either the charge control structure or a read-out mechanism (Figs 4b and 4c) and the charge

capacity is changed by the charge control structure throughout the exposure time such that substantially no portion of the pixel photo response curve is substantially linear (as shown in Figs 4b and 4c, the slope increased from substantially zero initially and the exponent n characterized the rate that changes with time) (Figs 4b and 4c, col. 5, line 56 – col. 6, line 32)

Regarding claim 10, this claim differs from claim 1 only in that the addition of limitation "a camera". Hawkins clearly discloses his invention related to enhancing the exposure latitude of image sensors (a full frame CCD; col. 1 lines 6-7 and col. 3, line 11). Thus claim 10 is analyzed and rejected as previously discussed with respect to claim 1 above.

Regarding claim 2, Hawkins discloses an image sensor (CCD image sensor) wherein multiplying each pixel by a substantially constant value compensates variations of the charge capacity (a constant intensity for a given pixel flux is assumed during integration) (col. 5, line 56 – col. 6, line 32).

Regarding claim 3, Hawkins discloses the charge capacity control structure is pulsed so as to substantially reproduce the photo response curve (at a predetermined time, appropriate bias voltage pulse signals are applied to the gate electrodes causing the charges to transfer along vertical CCD shift register) (col. 2, lines 42-46).

Regarding claims 4, 12, and 13, these claims are recited same limitations as claim 3. Thus they are analyzed and rejected as previously discussed with respect to claim 3 above.

Regarding claim 9, Hawkins discloses the image sensor is an interline CCD in which images are substantially read out of a vertical CCD before starting the integration in photodiodes of any next images (col. 2, lines 29-51).

Regarding claim 11, this claim recites same limitations as claim 2. Thus it is analyzed and rejected as previously discussed with respect to claim 2 above.

Regarding claim 18, this claim recites same limitations as claim 9. Thus it is analyzed and rejected as previously discussed with respect to claim 9 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 5, 8, 14, and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hawkins in view of Harton, US 2003/0107666.

Regarding claims 5, Hawkins does not does not explicitly disclose a look up table is used to translate the photo response curve into linear space for color filter processing.

Harton discloses a look up table (lookup table 2 334) which is used to translate the photo response curve into linear space for color filter processing (the image processor performs the conversion from integration time to optical power for each of the pixel sensors and may perform other image processing function such as color processing) ([0035]).

Hawkins and Harton are analogous art because they are from the same field of time integrating image sensors. At the time of the invention, it would have been obvious to a person of the ordinary skill in the art to use Harton's lookout table in Hawkins' image sensor. The suggestion/motivation would have been to enable the image processor to perform the conversion from integration time to optical power for each of the pixel sensors and may perform image color processing ([0035]).

Regarding claims 8, Hawkins discloses an image sensor comprising a charge control structure used to change charge capacity during the integration time. Hawkins does not does not explicitly disclose the image sensor is disposed in a digital camera that includes a mechanism to switch between linear and nonlinear photo response.

Harton discloses the image sensor is disposed in a digital camera that includes a mechanism to switch between linear and nonlinear photo response (Fig 2 and [0023]).

Hawkins and Harton are analogous art because they are from the same field of time integrating image sensors. At the time of the invention, it would have been obvious to a person of the ordinary skill in the art to use Harton's switch mechanism

in Hawkins' image sensor. The suggestion/motivation would have been to enable the selection between "Linear Mapping" to provide a linear relationship between the stored digital codes and "Nonlinear Mapping" to maximize the dynamic range of the sensor (Harton [0023]).

Regarding claims 14 and 17, these claims recite same limitations as claims 5 and 8, respectively. Thus they are analyzed and rejected as previously discussed with respect to claims 5 and 8 above.

6. Claims 6 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hawkins in view of Kawakami, US 2004/0263678.

Regarding claim 6, Hawkins discloses an image sensor comprising a charge control structure used to change charge capacity during the integration time. Hawkins does not does not explicitly disclose the multiplying gain change values are stored in a digital camera.

Kawakami discloses the multiplying gain change values (adjusted gain value) are stored in a digital camera (the average integrated value has been applied from the integration circuit 70 via the multipliers 72R, 72G, and 72B and they are temporarily stored in the memory 46) (see Fig. 2 and [0048]).

Hawkins and Kawakami are analogous art because they are from the same field of endeavor of system and method for charge control structure used to change charge capacity. At the time of the invention, it would have been obvious to a person of the ordinary skill in the art to use Kawakami's gain change values in Harton's

image sensor device. The suggestion/motivation would have been to enable an adjusted gain value for adjusting a variation between devices is applied to the multipliers and to discriminate a light source type such as day light, shade-cloudy, a fluorescent light, and a tungsten lamp based on the average integrated value of the signals for each of the divided areas (Kawakami, [0048]).

Regarding claim 15, this claim recites same limitations as claim 6. Thus it is analyzed and rejected as previously discussed with respect to claim 6 above.

7. Claim 7 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hawkins in view of Juen, US 5,341,220.

Regarding claim 7, Hawkins discloses an image sensor comprising a charge control structure used to change charge capacity during the integration time. Hawkins does not does not explicitly disclose the capacity control structure is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure.

Juen discloses the capacity control structure (vertical overflow drain structure) which is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure (flash light unit 13 is made ready to emit light and it is prepared to provide an auxiliary illumination during the immediately following imaging operation) (col. 8, line 64 to col. 9, line 13).

Hawkins and Juen are analogous art because they are from the same field of time integrating image sensors. At the time of the invention, it would have been

obvious to a person of the ordinary skill in the art to use Juen's flash light unit in Hawkins's image sensor device. The suggestion/motivation would have been to enable to provide an auxiliary illumination during the immediately following imaging operation thereby adjusted to product the desired photo (Juen, col. 9, lines 10-13).

Regarding claim 16, this claim recites same limitations as claim 7. Thus it is analyzed and rejected as previously discussed with respect to claim 7 above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Takahashi (US 6,999,123) discloses a method and apparatus for driving a solid state image sensor which completely discharges unnecessary charges during the shutter operation.
- Yonemoto et al. (US 4,875,100) discloses a solid state imager device which is capable of controlling its exposure time to a desired value by electronic measure.

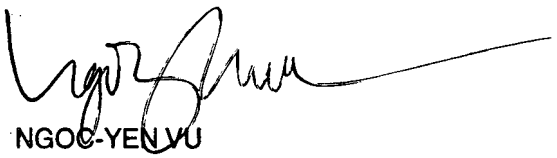
Inquiries

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

a. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-270-8300.

b. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kent Wang
4 June 2007



NGOC-YEN VU
SUPERVISORY PATENT EXAMINER